

ABSTRACT

Disulfide proteins showed mitigated allergenicity and increased digestibility by pepsin following reduction by thioredoxin. The sulfhydryl groups newly formed on reduction by thioredoxin (at 4°C) or dithiothreitol (DTT) (at 55°C) were blocked with a physiological disulfide, such as cystamine or oxidized glutathione (GSSG) to obtain stable forms of the disarmed allergen. When derivatized with cystamine, BLG was separated from its oxidized and reduced forms on non-reducing SDS-PAGE and appeared to lack sulfhydryl groups. Although less effective GSSG, gave similar results. Allergenicity of the two derivatives was compared with that of the oxidized, reduced and reoxidized forms of BLG by skin testing dogs from a colony sensitized to cow's milk. Both the cystamine and GSSG derivatized BLG showed decreased allergenicity and increased sensitivity to pepsin as compared to controls. The reoxidized form resembled the derivatives in having lower allergenicity. The thioredoxin- and DTT-reduced forms showed hypoallergenic, hyperdigestible properties, most effectively when the reduced proteins were heated at 55° C. Whole milk subjected to these procedures showed results similar to those obtained with pure BLG. Other proteins are similarly stabilized. Stable forms of such disarmed, hypoallergenic and hyperdigestible disulfide protein allergens or just hypoallergenic or just hyperdigestible protein allergens are useful in foods as well as clinical preparations.